852 13

Hold Heet

4 unit

Air Conditioning

S-8-13

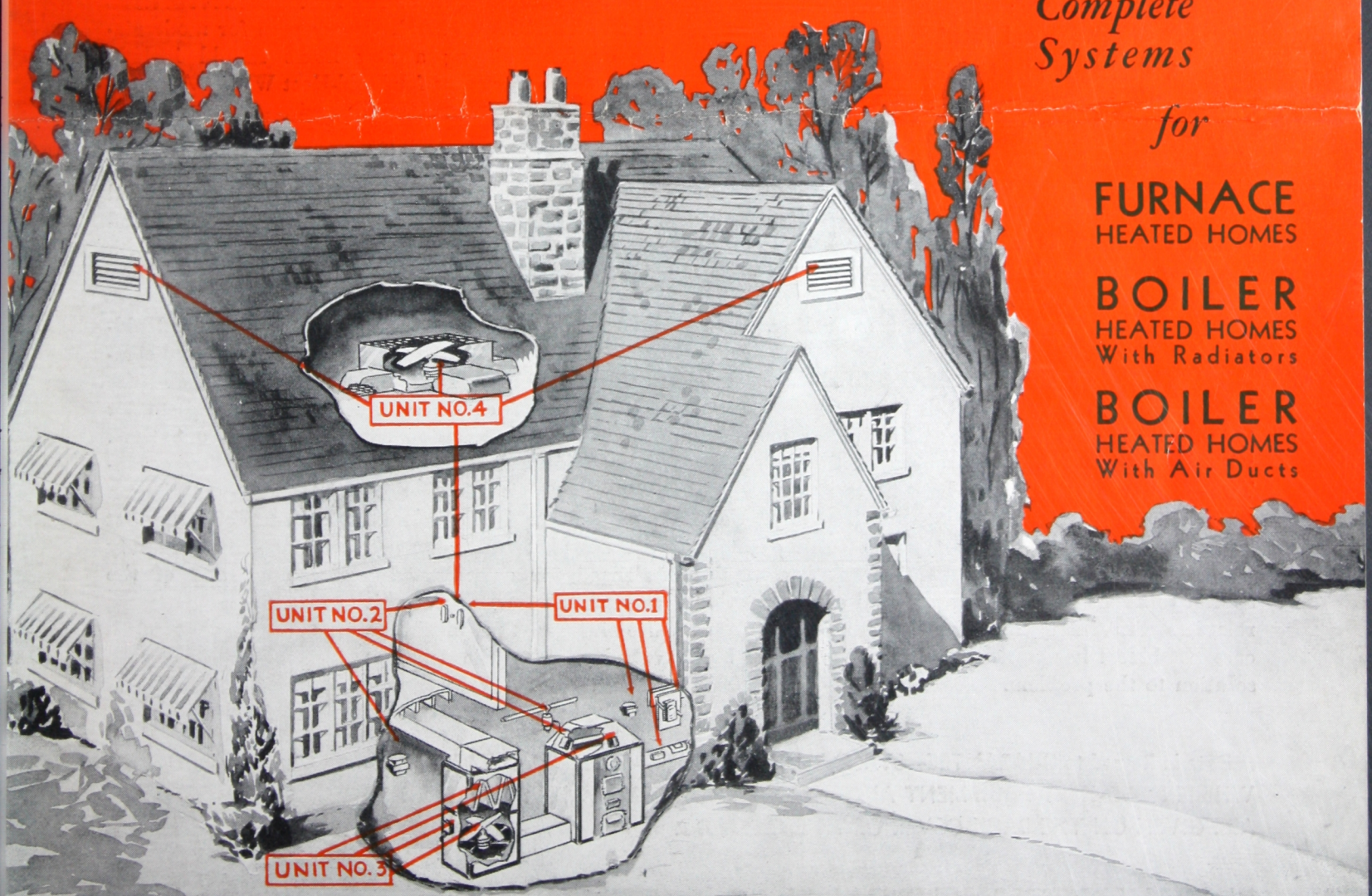
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Complete Systems for

FURNACE
HEATED HOMES

BOILER
HEATED HOMES
With Radiators

BOILER
HEATED HOMES
With Air Ducts



RUSSELL ELECTRIC COMPANY

INCORPORATED 1917

HOLD-HEET
AIR CONDITIONING EQUIPMENT

Better Apparatus Based on New Developments for Every Type of Domestic Heating Plant

To the man on the street, the word Air Conditioning means just one thing—Summer Cooling. The first step in air conditioning is, therefore, one of education—to bring out the point that complete air conditioning of the home requires 4 Major Functions or Operations.

THE 4 MAJOR AIR CONDITIONING FUNCTIONS ARE:

1. Heating.
2. Humidification.
3. Circulation and Filtering.
4. Cooling and De-Humidification.

THE HOLD-HEET 4-UNIT PLAN is simply the sectional bookcase idea applied to these four major functions—the supplying of four distinct co-ordinated groups of apparatus which may be conveniently purchased one group at a time under the Unit Plan, or they may all be purchased and installed together. The installation of the 4 Hold-Heet Units gives Complete Winter Air Conditioning and Summer Cooling.

THREE TYPES OF HEATING SYSTEMS. Home heating systems may be divided into three general types. No. 1, Furnace Heating; No. 2, Boiler Heating with Radiators; No. 3, The Combination of These Two—Boiler Heating with a Duct System of Heat Distribution. Several of the Hold-Heet functional Units work equally well with any type of heating system. Other Units, like humidifying and circulating, require special solutions because of the special conditions that relate to different types of heating systems. In each case Hold-Heet has worked out and supplies the best solution to the problem.

FURNACES, BOILERS AND BURNERS ARE NOT SUPPLIED BY HOLD-HEET—Hold-Heet equipments have been worked out for ideal operation with every type of heating plant and burner. They do not interfere in any way with the selection and installation of the heating system. Standard specifications and ratings on heating plants apply. No special engineering knowledge is required. Hold-Heet Units are completely assembled, ready to place and hook-up by the local heating man.

PROVIDE FOR COMPLETE AIR CONDITIONING IN EVERY HOME PLAN. Every plan for modernizing or for building a new home should include complete specifications for Hold-Heet Winter Air Conditioning and Summer Cooling equipment. There are no "equivalents" for Hold-Heet, for the Hold-Heet line is based on fundamental patented developments and standardized products. Performance is guaranteed when Hold-Heet is specified, for there is no divided responsibility. Only Hold-Heet builds every part of a complete, co-ordinating equipment.

It is easy to figure accurately the cost on any Hold-Heet installation, for retail prices of all parts and complete units are given. The home owner can add the individual units at his convenience, or a Complete Air Conditioning Installation can be made at one time. Only Hold-Heet offers this easy way to buy equipment—the Unit Plan. Specify Hold-Heet Units on every job. This not only insures that the equipment will be absolutely dependable, complete, properly balanced for co-ordinated performance and of the very latest type, but it also insures the maximum value which the market affords.



Data in Regard to GUARANTEE—STANDARDIZED PRICES—SPECIAL VOLTAGES, AND WHERE HOLD-HEET EQUIPMENT AND INSTALLATION SERVICE MAY BE OBTAINED ARE GIVEN ON THE BACK COVER OF THIS CATALOG.

RUSSELL ELECTRIC COMPANY, Manufacturers, 340 West Huron St., CHICAGO, U.S.A.

HOLD-HEET AIR CONDITIONING CHART

Showing the 4 Major Air Conditioning Functions

Each Performed by a Hold-Heet Unit of Corresponding Number

I HEATING (Winter)

A—GENERATION

1 Furnace
2 Hot Water Boiler
3 Steam Boiler
} Not Supplied by Hold-Heet

B—CONTROL

1 Coal—Hold-Heet Unit No. 1 Page 3
Room Thermostat, Regulator—with Stack Combustion Control—also Stoker Controls.

2 Oil } Automatic controls are integral with Gas } burner—not supplied by Hold-Heet.

II HUMIDIFICATION (Winter)

Each of the three types of heating requires a different type of humidifying system for an ideal solution. There is, therefore, a different Hold-Heet No. 2 Unit for each system.

A—GENERATION

1 Furnace Heat Page 4
Large Evaporating Pan in furnace bonnet

2 Boiler—Radiator Heat Page 5
Cast Evaporator heated by steam or hot water

3 Boiler with Duct System Page 6
Rick Evaporator in top of air conditioning cabinet.

B—CONTROL

1 Furnace Heat Page 4
Room Humidistat, Solenoid Valve, Float Switch

2 Boiler—Radiator Heat Page 4 & 5
Room Humidistat, Solenoid Valve, Float Switch

3 Boiler with Duct System Page 4 & 6
Room Humidistat, Solenoid Valve, Contact Switch.

III Air Circulation and Filtering

There is a Hold-Heet No. 3 Unit for every kind of heating system—with some systems the equipment for this function is most economically combined with the functional equipment of Unit No. 2.

A—GENERATION Page 9
The Hold-Heet Planoidal Blower represents "the last word" in an efficient, noiseless air mover for every type of air conditioning installation—regardless of size.

FILTERING Page 7
Throw-away Hold-Heet Filters of the dry type are of low resistance. They are superior in their ability to catch dust because of the improved viscous coating which does not harden.

B—CONTROL Page 3 & 7
The Hold-Heet Control Switch is actuated by the temperature of the heating medium. No heat—no circulation.

IV Cooling and Dehumidifying

A—GENERATION

1 Reduction of Sensible Heat Page 8
Giant Nite Fan—the only summer cooling system the average home can afford either to purchase or to operate.

2 Dehumidification—extended surface in air stream of Unit No. 3 with circulating coolant, write for information.

B—CONTROL

1 Automatic time control of Giant Nite Fan Page 8

2 Room Thermostat with Summer-Winter Switch controls de-humidification—write for information.

1

UNIT No. 1 TEMPERATURE and COMBUSTION CONTROL

Cat. No: PU15P | Retail Price: $29.50 | See Page: 3

The Hold-Heet Regulator Set with its exclusive Stack Limit Switch to control combustion is used with all types of heating systems employing solid fuel whether they be furnaces or boilers.

2

UNIT No. 2 for FURNACES - all types

PUH 35.20 4

Humidity Control and Supply—Large Evaporating Pan for furnace bonnet complete with all controls.

UNIT No. 2-3 for All Boiler-Radiator Systems

ACB1 124.50 5

Filtering, Air Circulation, Humidity—Cabinet for attaching to basement ceiling contains Capacitor Motor, Planoidal Blower, Filters and large cast iron Evaporator heated with steam or hot water. All automatic controls are supplied.

3

UNIT No. 2-3 for BOILER-DUCT SYSTEMS

ACBD1 385.00 6

Filtering, Air Circulation, Humidity—Cabinet in basement alongside boiler contains Capacitor Motor, Planoidal Blower, Filters, Rick Type Evaporator and Heat Exchanger of 130,000 B.t.u. capacity—complete with all automatic controls.

UNIT No. 3 for FURNACES - all types

ACA1 84.25 7

Filtering and Forced Air Circulation—Cabinet for mounting alongside furnace contains Capacitor Motor, Planoidal Blower and Filters complete with automatic fan control. Installed in cold air return to furnace.

4

UNIT No. 4 SUMMER COOLING

GN1 152.00 8

Works With Any Type of Heating Plant—The only way to cool the entire house in summer at low cost. A noiseless Giant Nite Fan (Planoidal Blower) for attic installation which forces large volumes of cool night air through the house. It cools the entire physical structure and contents and maintains house temperatures from 10° to 15° below outdoors during the daytime.

THERE IS A HOLD-HEET 4-UNIT SYSTEM OF COMPLETE WINTER AIR CONDITIONING AND SUMMER COOLING FOR EVERY TYPE OF DOMESTIC HEATING PLANT

Furnace Heat Systems

UNIT NO.	CAT. NO.	PRICE	PAGE
1	PU15P	$ 29.50	3
2	PUH	35.20	4
3	ACA1	84.25	7
4	GN1	152.00	8
Total Equipment Cost		$300.95	

Boiler-Radiator Systems

UNIT NO.	CAT. NO.	PRICE	PAGE
1	PU15P	$ 29.50	3
2-3	ACB1	124.50	5
4	GN1	152.00	8
Total Equipment Cost		$306.00	

Boiler-Duct Systems

UNIT NO.	CAT. NO.	PRICE	PAGE
1	PU15P	$ 29.50	3
2-3	ACBD1	385.00	6
4	GN1	152.00	8
Total Equipment Cost		$566.50	

All prices shown in this catalog are f.o.b. factory prices, not installed. The dealer adds freight and installation charges in quoting home owner.

COPYRIGHT 1934

HOLD-HEET UNIT No. 1

Automatic Control *of* Temperature & Combustion

For Any Type of Coal Burning Heating Plant

With the Hold-Heet No. 1 Unit "Automatic Heat" Is the Cheapest Heat



ROOM THERMOSTAT

The Hold-Heet Room Thermostat is not only aged for permanence but calibration is so reliable that one can accurately read room temperatures by moving the adjustment lever to where it "clicks." 3-wire, low voltage, with magnetic quick make-and-break action, differential 2° F, range 60-80° F, size 2½x5½x1⅝ in., molded bakelite base, brass cover finished in statuary bronze. The absolute freedom from trouble of over fifty thousand of these thermostats in the field proves that this is one of the finest devices of the kind ever built.

No. U3R..... Retail price $4.50

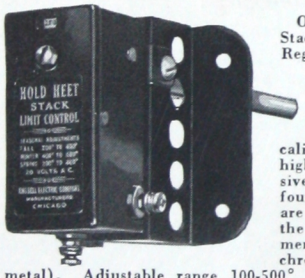


TRANSFORMER

The Hold-Heet Transformer of the Underwriters Approved Type provides full safety protection even though short circuited. By stepping down household voltages with this transformer it is possible to effect large savings in installation expense through the use of low voltage wiring, which is easily and inexpensively installed. 115-20 volts. 30-volt-amperes.

No. U50..... Retail price $3.10

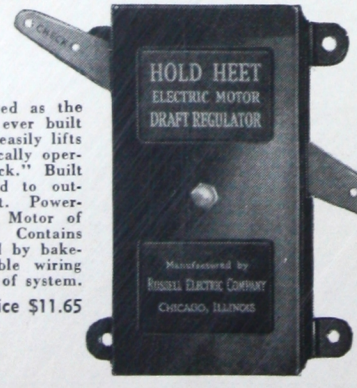
STACK LIMIT CONTROL



Only Hold-Heet supplies a Stack Limit Control with a Regulator Set. This is the same field proven device that is used by over fifty Stoker manufacturers. It is built to maintain accurate calibration in spite of any high temperatures or corrosive conditions that may be found in the stack. There are no moving parts inside the stack. The only exposed member is a heavy nickel chromium tube (Allegheny metal). Adjustable range 100-500° F, differential 50°. All Hold-Heet Limit Switches are 3-wire and have magnetic snap action.

No. U3P Stack Limit Control..... Retail price $ 8.35
No. U3A Warm Air Limit Control..... Retail price 7.75
No. U3W Hot Water Limit Control..... Retail price 8.35
No. U3S Steam Pressure Control..... Retail price 10.85

DAMPER MOTOR



Everywhere recognized as the finest Damper Motor ever built—the most powerful—easily lifts 25 pounds. Automatically operates "Draft" and "Check." Built and factory lubricated to outlast any heating plant. Powerful 4-Pole Ballentine Motor of high starting torque. Contains wiring panel protected by bakelite cover with suitable wiring terminals for all parts of system.

No. U15.... Retail price $11.65

UNIFORM HEAT is Essential to Health and Comfort. In these days of light winter clothing and warm homes, slight temperature changes can chill. Uniformity of temperature has become most important from the standpoint of both health and comfort. Overheating is as unhealthful as underheating, and hot-to-cold-to-hot is most dangerous of all. It is next to impossible to maintain uniform temperatures by hand regulation. Every slight change in weather, each shift of the wind must be reckoned with. Thermometer watching—constant vigilance—endless trips to the basement—all together can not equal automatic control. This problem can be solved for all time by installing a Hold-Heet No. 1 Unit to provide automatic temperature control.

COMBUSTION CONTROL. The Ordinary "Regulator Set" is not a Combustion Control. A regulator set with a bonnet switch or a hot water limit control that closes the drafts half an hour "too late"—resulting in bad over-runs of temperature and waste of fuel, is not combustion control. Worst of all is the regulator set without any limit switch. Picture what happens on a cold day with the heating plant full of fresh fuel if a window is left open in the room with the room thermostat.

A Stack Limit Control is Necessary. It gives positive control over combustion for the coal fired heating plant. Stack Control—pioneered by Hold-Heet—was unknown a year ago. It is today employed by 59 of the 76 furnace manufacturers. Here are the three exclusive advantages:

1. Stops-Up-the-Chimney-Waste—Excess stack temperatures mean "coal dollars" flying up the chimney. The Hold-Heet Stack Control guards the coal pile. It double checks heating plant operation by limiting fuel combustion to heat that may be efficiently used. It closes the draft on an excessive rise in stack temperatures.
2. Protects the Heating Plant—99% of all heating equipment does not wear out—it burns out. Exclusive Hold-Heet Stack Control prevents over-heating and injury to the heating plant.
3. Prevents Over-Runs—Over-runs are the greatest cause of fuel waste. Stack Control keeps the fire under absolute control, so that it is easily checked by the room thermostat without over-runs of room temperature.

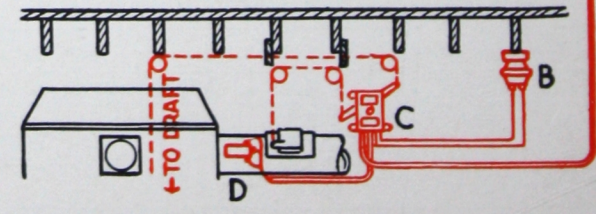
A Stack Limit Switch to insure combustion control is standard equipment with every Hold-Heet No. 1 Unit.

FOR ALL TYPES OF HEATING PLANTS. This same No. 1 Unit is recommended for ALL types of heating plants whether they be furnace or boiler systems. The installation of this Unit is the first step towards complete air conditioning of the home.

NO. 1 UNIT—4 PIECES, as Pictured at Left, Complete with All Accessories. Retail Price.. $29.50

How Unit No. 1 Works

Simply set the Room Thermostat (A) at the temperature to be maintained. The Damper Motor (C) opens and closes the drafts automatically as required. The Transformer (B) "steps down" household current to 20 volts to save wiring expense. The Stack Limit Control (D) double checks heating plant operation, stops up-the-chimney waste, protects the heating plant from injury through over-heating, and prevents over-runs of room temperature.



Key to Diagram

A—Room Thermostat
B—Transformer
C—Damper Motor
D—Stack Limit Control

RUSSELL ELECTRIC COMPANY

HOLD-HEET UNIT No. 2

Complete Automatic Humidity *for all* Furnace Heated Homes



Humidistat



Humidity Valve

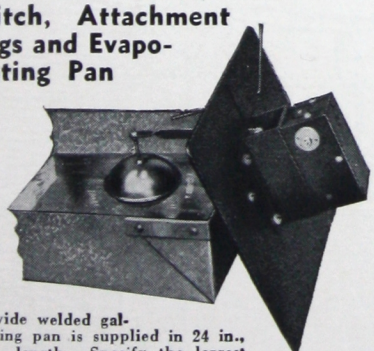
THE HOLD-HEET ROOM HUMIDISTAT is a thoroughly reliable, adjustable automatic humidity control. It introduces a new principle by supporting the responsive member on Invar metal so that accuracy is independent of temperature variation. Quick response is obtained by having a maximum exposed area and minimum wall thickness to the specal wood block with 5⅝ sq. ins. of responsive surface. The pilot bulb lights when the instrument calls for humidity (standard 2.5 volt—½ ampere radio dial pilot bulb). The Humidistat duplicates the size and statuary bronze finish of the Room Thermostat described on the opposite page. Adjustments are made by a revolving projecting adjustor at the base. 2-wire low voltage magnetic snap action.

No. U2H Humidistat..... Retail Price $9.00

THE HOLD-HEET HUMIDITY VALVE IS FIVE DEVICES IN ONE. (1) pipe attachment clamp which only requires the drilling of a $\frac{5}{16}$ in. hole in the lower side of the water supply line, (2) strainer, (3) electric solenoid valve of remarkably low current consumption, (4) adjustable flow regulator—not a needle valve but a dependable asbestos packing under compression, (5) visible drip fitting to show rate at which water for humidification is being supplied.

No. U2V Valve.....Retail Price $10.50

Float Switch, Attachment Fittings and Evaporating Pan



The electric float switch eliminates the need of a drain—it prevents the waste of water. Seamless 8 in. wide welded galvanized evaporating pan is supplied in 24 in., 36 in. or 48 in. length. Specify the largest size furnace bonnet will accommodate so as to insure ample evaporating capacity. Replace pan when filled with lime.

No. U2F Float Switch with Mounting Fittings, Evaporating Pan, 10 ft. of ¼-in. copper water tubing and low voltage wiring.....Retail Price $13.25

IT IS NOW POSSIBLE to buy complete, fully Automatic Humidity Equipment with adjustable Room Humidistat Control for the Furnace Heated Home—equipment of adequate capacity—complete equipment all in one package—every part built for co-ordinated performance by one responsible manufacturer—there is nothing more to buy.

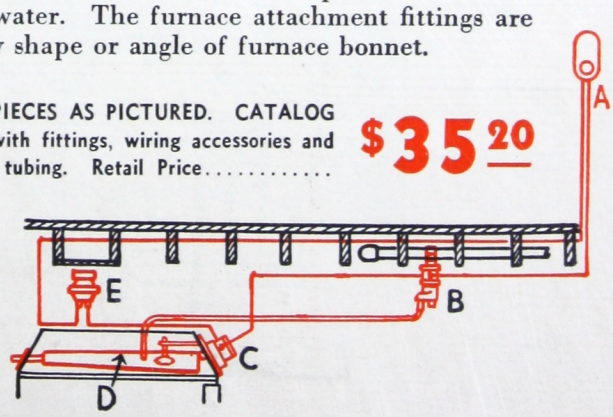
Page 10 tells the importance—the necessity of proper winter humidification in the home and gives data on how to judge home humidifiers. This data has been carefully prepared and it merits thorough study and consideration. Most humidifying devices are inadequate makeshifts. The necessity of ample capacity equipment and the inadequacies of ordinary devices may be realized by considering that from 70 to 140 gallons of water evaporation per week are required by the average home in extreme weather.

OPERATION OF HOLD-HEET UNIT NO. 2

In the Furnace Heated Home

By turning the adjusting screw at the base of the Room Humidistat (A), the humidity is regulated for the entire house. The percentage of relative humidity for which the Humidistat (A) is adjusted will be maintained automatically day by day. Whenever the humidistat is calling for humidity the pilot bulb is lighted and thereby becomes a constant guide as to the functioning of the equipment. The Adjustable Flow Regulator on the Solenoid Valve (B) is adjusted in accordance with complete instructions that are supplied with the equipment so as to have a little greater rate of flow than the maximum humidity requirements of the home—(approximately 1 gallon per hour or 24 gallons per day). Whenever the Room Humidistat (A) calls for humidity, the Solenoid Valve B is automatically opened and supplies water to the ample size evaporating Pan (D) which is placed in the bonnet of the furnace above the radiator. The inexpensive pan is of the renewable type and is to be replaced when it becomes filled with lime. The Transformer (E) "steps down" household current so as to save wiring expense. The Electric Float Switch (C) closes the Humidity Valve whenever the Evaporating Pan (D) becomes filled with water so as to prevent overflowing and waste of water. The furnace attachment fittings are designed to fit any shape or angle of furnace bonnet.

NO. 2 UNIT—FIVE PIECES AS PICTURED. CATALOG NO. PUH. Complete with fittings, wiring accessories and 10 ft. of copper water tubing. Retail Price..... **$35.20**



KEY TO DIAGRAM

- A. Room Humidistat
- B. Hold-Heet Humidity Valve
- C. Float Switch
- D. Evaporating Pan
- E. Transformer

HOLD-HEET UNIT No. 2-3

Winter Air Conditioner

for all

Boiler Heated Homes with Radiators



Automatic Humidity
Air Circulation
Air Filtering

BY ADVANCED ENGINEERING Hold-Heet has built a compact, efficient Unit of enormous capacity. It is fully automatic and does a thorough job which has heretofore required bulky equipment of many times its size and cost. The Blower operates automatically whenever there is heat in the Unit. The operating cost for electricity is but 1½c to 3c per day. Capacity 42 gallons of evaporation per day with steam; 36 with hot water.

INSTALLATION and OPERATION. The Unit is suspended from the basement ceiling below a 16x25 in. grilled opening to be provided in the floor of the main living room. The outlet for air discharge will fit between the ordinary 16 in. centering of floor beams. Grilled floor openings to the basement are provided in one or more rooms that are remote from the Unit so as to provide the return air circuit through the basement. (It is seldom necessary to employ ducts for the cold air return.) A ¾ in. steam or hot water line is connected to the hollow evaporator chamber and the water supply line is connected through the Humidity Control Valve. The noiseless Planoidal Blower is controlled by a line voltage Limit Control on the side of the Evaporator. It runs approximately one-half the time. The suction of the two cold air returns and the induced drafts that are created are sufficient for circulating air throughout the house. There is ample blower capacity for several complete changes of air per hour in most residences. The delivery is 800 c.f.m. against .1 in. static pressure. Outputs up to 1000 c.f.m. are obtained on low resistance circuits. The volume is adjustable by means of the 100-speed control. The adjustable Room Humidistat controls the electric Humidity Valve to supply water for humidifying, just as required.

THE RETAIL PRICE of the complete Unit No. 2-3, Catalog No. ACB1, fully assembled with all accessories as described at left is..... **$124.50**

THE COMPLETE EQUIPMENT Retail Price $124.50

The complete equipment Catalog No. ACB1 includes all equipment listed below:

NO. CF1816 MOTOR AND BLOWER

18-in. Planoidal Blower, direct connected to vertical, 8-pole, ½ hp. Ballentine Capacitor Motor. (See page 9 for full data on these marvelous developments.)

NO. U2H HUMIDISTAT with Pilot Light... (Page 4)
NO. U2V HUMIDITY VALVE—5-in-one ... (Page 4)
NO. U50 TRANSFORMER (Page 3)
NO. U2F FLOAT SWITCH (Page 4)
2 NO. F2 FILTERS..... (Page 7)

NO. U3W HOT WATER LIMIT CONTROL

Hold-Heet Line Voltage Clamp-on Type. Operates Blower only when heat is available for evaporating water.

CONTROL BOX (Page 9)

Contains 100-speed Control with Oil Condenser and Switch.

EVAPORATOR—Size 25x25 In.

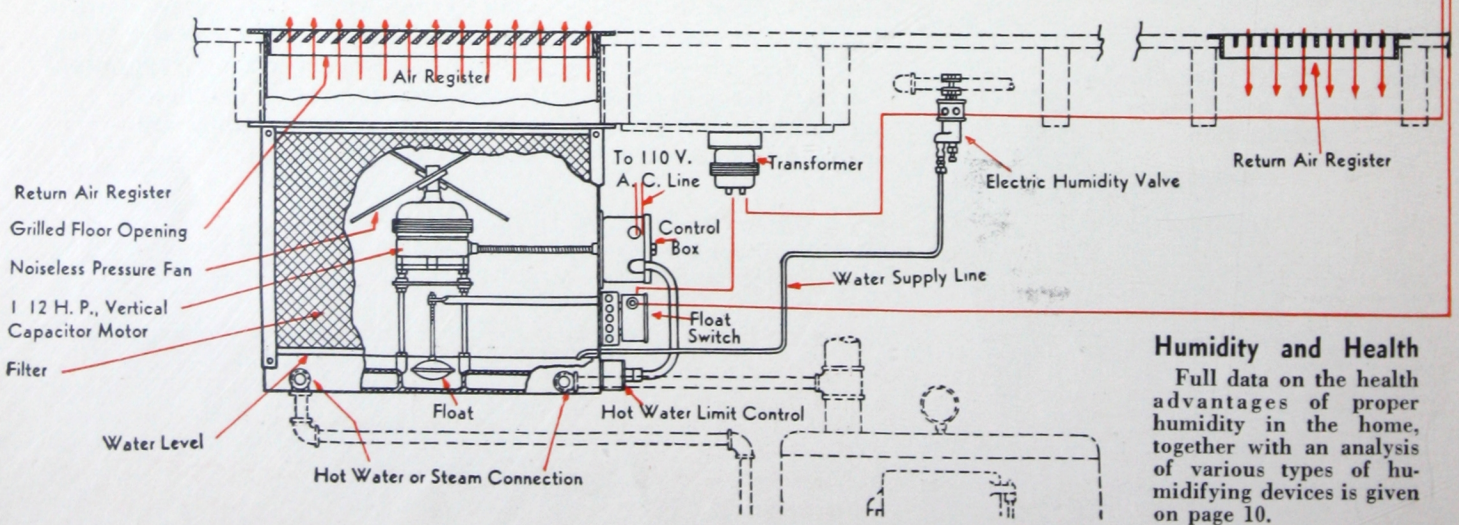
Finished in vitreous enamel. Provides ample evaporating surface in contact through hollow casting with heat of steam or hot water supply.

CABINET—Size 25x25x20½ In. High

Substantial steel cabinet in gray enamel finish with removable panels for easy access.

ALL ACCESSORIES SUPPLIED COMPLETE

The Equipment includes full instructions, with Low Voltage Wiring and Copper Water Tubing.



Humidity and Health

Full data on the health advantages of proper humidity in the home, together with an analysis of various types of humidifying devices is given on page 10.

HOLD-HEET UNIT No. 2-3

Winter Air Conditioner

For Boiler Heated Homes with Air Ducts (Duplex System)

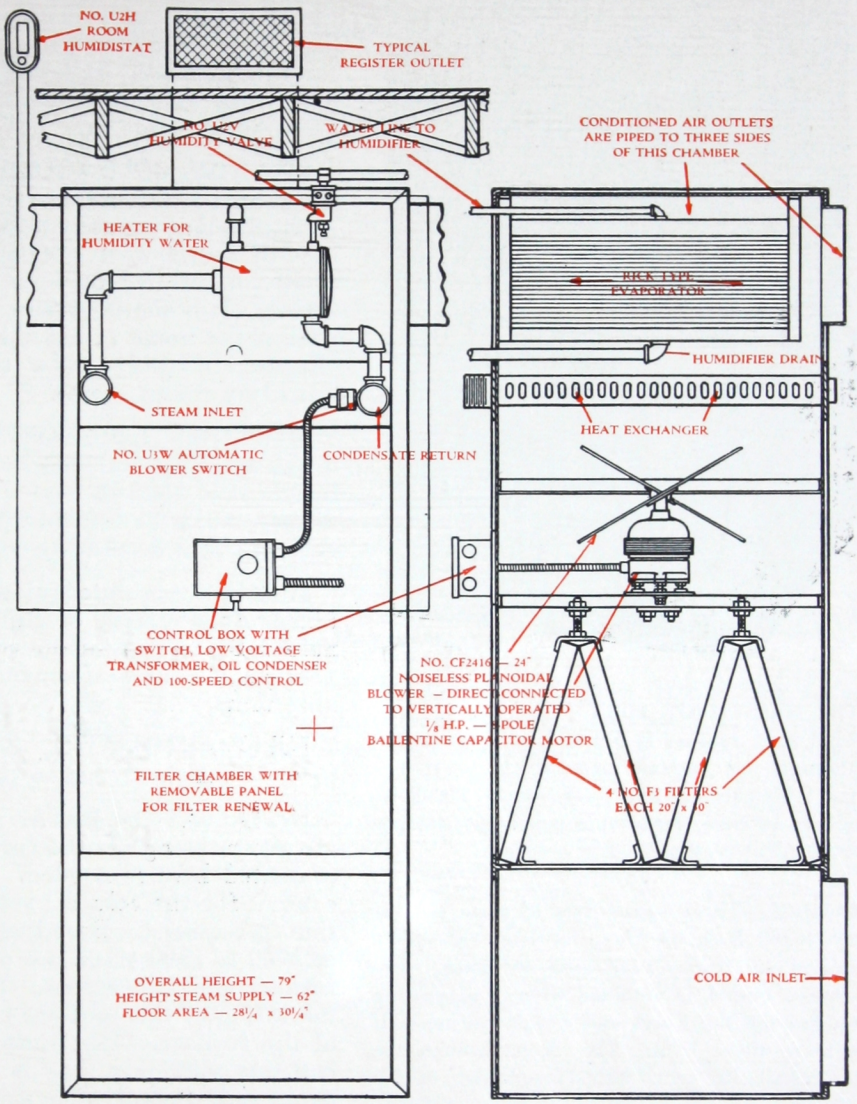
HUMIDIFIES—FILTERS—HEATS AND CIRCULATES AIR THROUGH DUCT SYSTEMS

THE HOLD-HEET Equipment for air conditioning the boiler heated home with a duct system of heat distribution is not limited to new installations. The old furnace heated home may be easily converted into this system by purchasing a boiler and adding the four Hold-Heet Units. In this way the superior advantages of both boiler and furnace heated systems may be obtained without the disadvantages of either. It is not necessary to purchase radiators, as the Heat Exchanger supplied as part of Unit No. 2-3 provides ample capacity to take care of the entire house.

In this system, Forced Circulation and Filtering are most economically combined in one Unit, No. 2-3, together with a Heat Exchanger of ample capacity to take the place of all the radiators normally required in the home.

THE EQUIPMENT IS COMPLETE. Catalog No. ACBDI combines in a single unit: 4 No. F3 Filters (page 7); No. CF2416, ⅛ hp., 8-pole Ballentine Capacitor Motor, direct-connected to a noiseless Planoidal Blower (page 9); Control Box containing Low Voltage Transformer, Switch, and 100-speed Control (page 9); Heat Exchanger of 130,000-B.t.u. capacity; Rick Type Evaporator of ample capacity; Water Heater for Evaporator water; No. U2H Room Humidistat (page 4); No. U2V 5-in-one Solenoid Humidity Valve (page 4); No. U3W Line Voltage Limit Switch to operate Blower only when there is heat in the unit (page 4); heavy steel Cabinet—30¼x28¼x79 in. high—finished in gray enamel.

OPERATION. Air is first drawn through the Filters where it is cleaned. It then passes through the large extended surface of the Heat Exchanger where it is warmed; humidity is then added, and the conditioned air is circulated throughout the house by means of the Blower and a suitable duct system corresponding to the ordinary piping system of the furnace heated home. By means of the Switch in the Control Box, summer filtering and air circulation may be obtained when heat is not required, or cool air may be circulated by installing cooling coils in the adequate space which is provided in the base of the Unit.



It Is the Opinion of Many Experts That This Type of Heating System with Automatic Air Conditioning Equipment Represents the "Last Word" in Heating and Air Conditioning for the Modern Home

OPERATION IS FULLY AUTOMATIC. The circulating Blower only operates when there is heat in the Unit. Humidity is under the automatic control of the Room Humidistat which controls the adjustable electric Humidity Valve that supplies water through a water heater to the Rick Type Evaporator where humidification is accomplished. The Evaporator consists of a brass pan with many small holes through which hot water (preheated by a heating coil) slowly drips on a series of zig-zag screens. The warm air in passing over these screens absorbs moisture. Excess moisture, carrying most of the lime, is carried down the drain. The adjustable Humidity Valve is regulated to limit the flow.

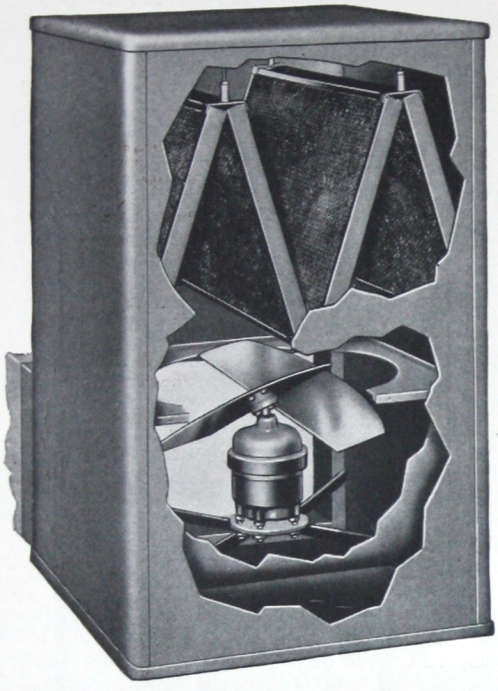
The boiler for supplying steam for the Heat Exchanger is not included with this equipment. Any suitable steam boiler of proper capacity may be employed.

CATALOG NO. ACBD1—Complete assembled Unit as pictured and described. Retail Price..... **$385.00**

HOLD-HEET UNIT No. 3

Winter Air Conditioner

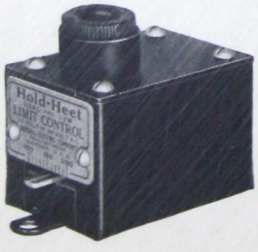
Forced Air Circulation and Filtering for Furnace Systems



THE FINEST UNIT BUILT. The heavy, rigid, welded steel cabinet is finished in gray enamel containing just enough green shade to give it "life." Height—51 in., floor space—28x30 in. There is an easily removable panel for filter renewal and inspection.

RATINGS. Three square feet of grate area or less, 140,000 B.t.u. per hour or less, 450 sq. in. of warm air leader pipe area or more. The maximum output is obtained when the pressure drop through the filters and circuit resistance is not more than .1 in. The drop through the filter installation when half loaded with dirt is .02 in. at 2000 c.f.m.

CONTROL BOX contains 100-speed control to vary motor speed and blower output, together with oil condenser and switch. See page 9 for cut and description.



FAN SWITCH

The adjustable line voltage Fan-Switch automatically operates the furnace blower only when there is heat in the furnace bonnet.

No. U3AC
Fan-Switch..Retail Price $8.35

FORCED AIR CIRCULATION AND FILTERING are recognized as essential parts of every modern furnace installation (see data on page 10). Hold-Heet has developed a standardized universal unit for this purpose. It takes care of the 10-room house or the small bungalow. Simply adjust the 100-speed control to give the required air volume or to "tune out" duct vibrations.

RECLAIMS COLD ROOMS FOR WINTER USE. Forced circulation takes heat to all rooms, regardless of exposure or wind direction. Heating plant capacity and efficiency are increased. The shortcomings of faulty duct systems are often overcome and heat is more evenly distributed between floor and ceiling. There is marked fuel saving. It is not necessary to force the heating plant and overheat part of the home in order to warm the more remote rooms. It cuts "heating-up time" to a fraction—insures "dressing comfort" in quickly warmed rooms.

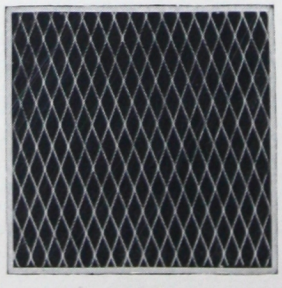
SIMPLIFIES HOUSEKEEPING—ENDS DRUDGERY. Unit No. 3 draws the dust and dirt laden air from the rooms several times an hour. It is filtered, heated and returned dust free. Saves curtains, drapes, walls and furnishings—materially reduces dusting, housecleaning, and decorating costs.

SILENT. Absolute quietness is proof of unusual efficiency. The outstanding feature of this equipment is the 22-in. Noiseless Planoidal Blower direct-connected to a Ballentine Capacitor Motor. (See page 9 for performance curves and full data on these remarkable units.)

FULLY AUTOMATIC. The Blower runs automatically whenever there is sufficient heat in the furnace bonnet.

INSTALLATION DATA. The Unit is easily installed in the cold air return alongside the furnace at a minimum expense. No special cemented base is needed. Installer cuts a hole in the top of the cabinet for the cold air return so that no expensive hood construction is required. By adjusting the 100-speed control, air deliveries of 1000 to 2500 c.f.m. are obtained through the resistance of filters, furnace and duct system. Furnaces requiring capacities in excess of the rating of this unit are best served by two units on opposite sides of the furnace. This simplifies the piping of the cold air returns, and one unit only may be operated in mild weather. Automatic, two-speed control of a single unit may be obtained without any change in equipment by installing a second Fan-Switch.

UNIT NO. 3—CATALOG NO. ACA1. Complete with cabinet, four filters, motor, blower, 100-speed control box, and fan-switch for automatic operation. Retail Price..... **$84.25**



HOLD-HEET AIR FILTERS

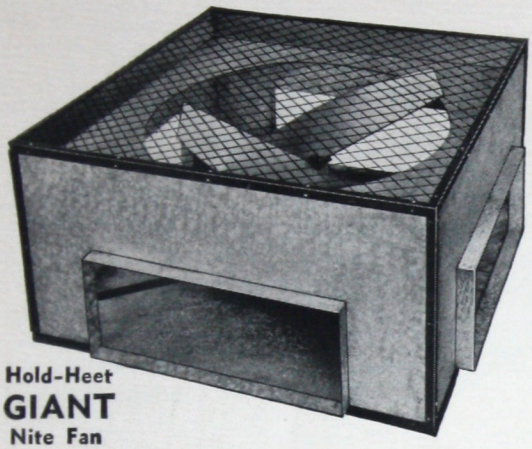
4 No. F3 Filters—2400 sq. in. of filter are employed—double the usual amount—giving one-fourth the filter resistance found in competing units (resistance varies with the square of the air velocity). This gives 2-year filter life—double the usual amount—and permits free gravity circulation of heat when the blower is not running. Hold-Heet Filters (throw-away type) have a non-sagging, self-supporting steel frame. They have an improved non-hardening viscous coating. Greatly increased ability to hold minute particles of dust and pollen is combined with low resistance and large loading capacity.

Catalog No.	Size, In.	Number in Carton	Retail Each
F1	20x20x1½	6	$1.50
F2	16x25x1½	6	1.50
F3	20x30x1½	4	2.25

HOLD-HEET UNIT No. 4

The Only Way to Cool The Entire House . . . *at Low Cost*

Summer Cooling for Every Home



Hold-Heet
GIANT
Nite Fan
Trade-Mark

THIS IS TRULY A GIANT Fan with its noiseless delivery of 6000 to 10,000 cu. ft. of air per minute. The 36 in. Planoidal Blower is direct-connected to a 12 pole, 1/3 h.p., vertically operating Ballentine Capacitor Motor which operates at 530 r.p.m. (Full data on these marvelous developments is given on page 9.) The equipment is completely assembled in a steel cabinet 48x48x24 in. which may be disassembled for installation. The cooling effect obtainable from this Blower during a summer season equals the results that would be obtained from melting six hundred and sixty 100 lb. cakes of ice. It would take twenty 100 lb. electric refrigerators to equal the cooling rate of one Giant Nite Fan which has an operating cost of only 1½c per hour when running.

HOW THE UNIT WORKS. The diagram shows the recommended type of Nite Fan installation on the floor of the attic above a grilled opening of 10 sq. ft. to be placed in the upstairs hallway beneath the Nite Fan. Two large ventilating windows or louvres are installed on opposite sides of the attic. By this means, the Nite Fan always exhausts with the wind and never has to operate against wind pressure. These same louvres provide daytime attic ventilation when the Nite Fan is not running.

Cool night air is drawn through bedroom and main floor windows and exhausted through the attic outlets, as shown. The equipment is operated only during the night, and the house windows are closed during the daytime. A time switch, supplied with the equipment, automatically starts blower operation at 6 o'clock p.m. and stops the blower at 6 o'clock a.m.

THE WORLD is indebted to research work at The University of Illinois for the discovery of the only way to cool the entire house in summer at low cost. It was found that 43 tons of ice were required to cool the average home in summer. It was further developed that 33 tons of this effect could be obtained with a large exhause fan giving at least 17 complete air changes per hour during the night. The cool night air (average 20° cooler than the daytime maximum) was drawn through the bedroom and first floor windows and exhausted through the heated attic. In addition to the cooling "sea breeze" through every room during the night, this volume of air reduces the temperature of the entire physical structure of the house and its contents, leaving cool walls and furnishings capable of absorbing most of the heat that enters the home during the following day.

This system would not work in a tent because there is no heat storage capacity. Its success depends upon the large mass of the house and its attendant heat storage capacity. Everyone has noticed this effect in early summer when many hot days occur before the inside of the house is heated up. Also in the fall, the house may remain warm for several days after the weather is fairly cold outside. The greater the mass of the house and contents, the more pronounced this effect becomes. Without adequate blower capacity, the results obtained are slight, for each passage of air with its small heat capacity can only remove a small amount of heat. With many air changes—at least 17 per hour—it is possible to obtain an enormous cooling effect which maintains the house from 10° to 15° below daytime outdoor temperatures.

A SUCCESSFUL COOLING SYSTEM Every Home Can Afford. When the possibilities of this discovery are known and appreciated—a Giant Nite Fan installation with its adequate capacity will be considered just as necessary a part of the home equipment as the heating plant. It will form the backbone of EVERY home cooling system. Additional home cooling equipment, if any, should be of a supplemental nature. Approximately 25% of the normally required mechanical cooling equipment is all that is necessary for use with a Nite Fan installation when absolute control of summer cooling is desired. The cooling coils of such equipment are mounted in the Hold-Heet Unit No. 3, which provides the circulating means for the cooled (de-humidified) air of such a system. All authorities agree that the AVERAGE home can neither afford to buy nor to operate mechanical cooling equipment of sufficient capacity to cool the home. The Giant Nite Fan is THE answer to this problem.

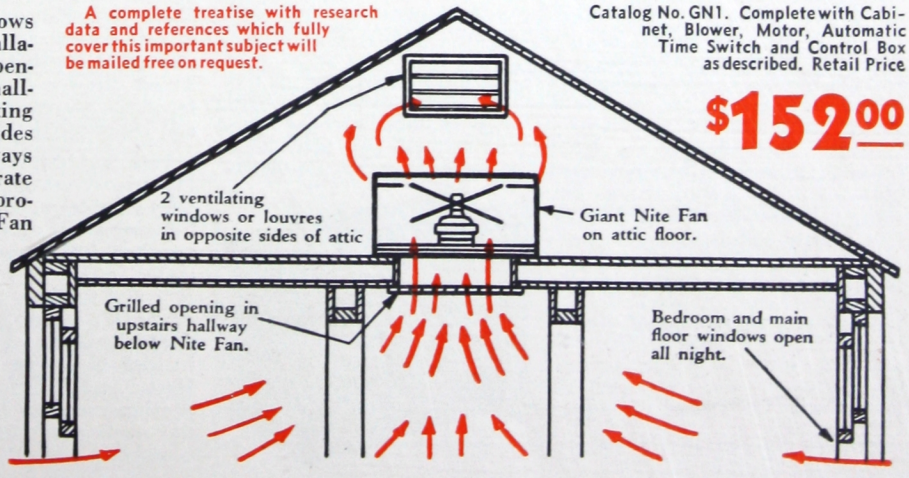
COOLING WITH GIANT NITE FANS

A complete treatise with research data and references which fully cover this important subject will be mailed free on request.

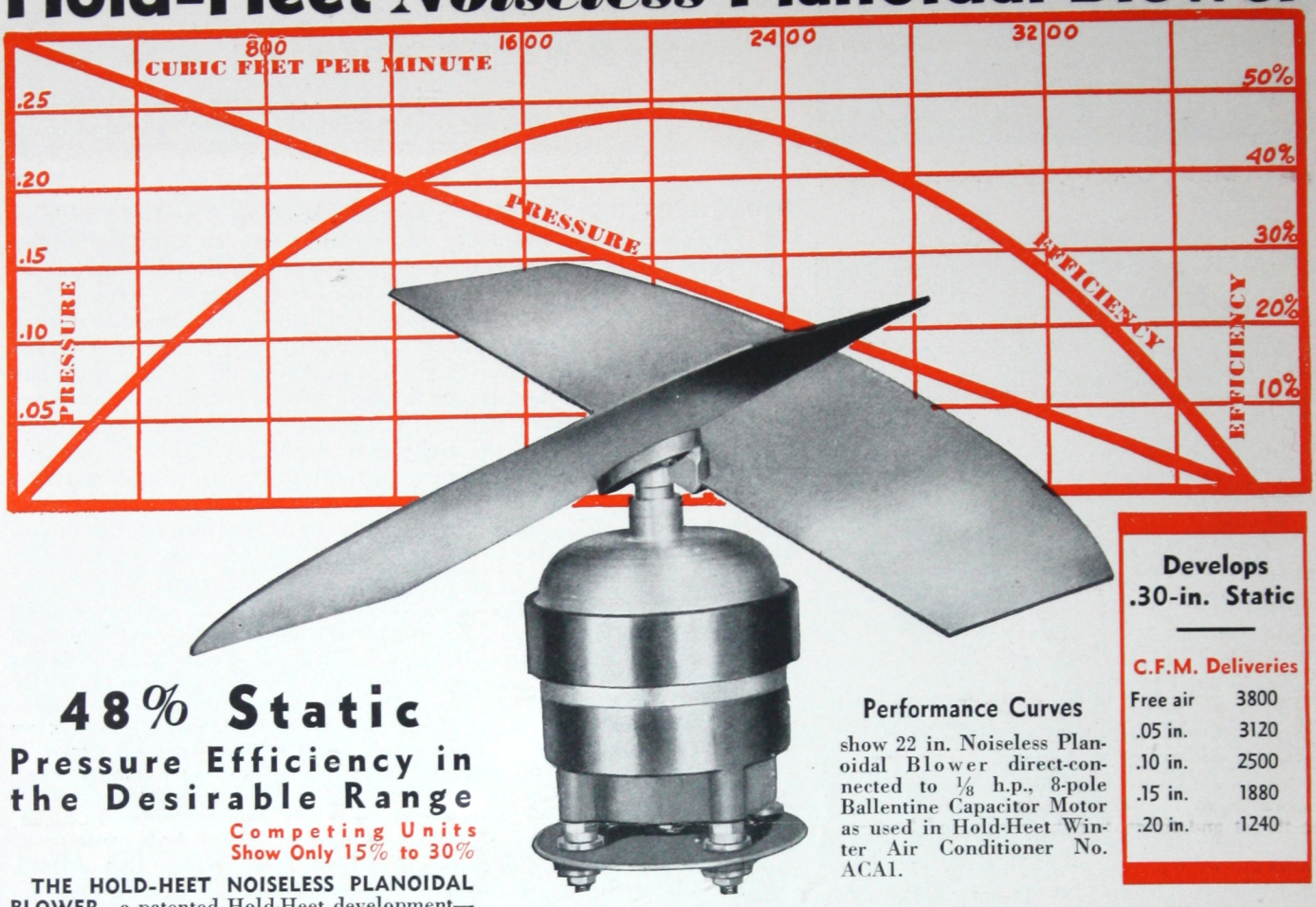
HOLD-HEET UNIT NO. 4

Catalog No. GN1. Complete with Cabinet, Blower, Motor, Automatic Time Switch and Control Box as described. Retail Price

$152.00



Hold-Heet *Noiseless* Planoidal Blower



48% Static

Pressure Efficiency in the Desirable Range

Competing Units Show Only 15% to 30%

Develops .30-in. Static

C.F.M. Deliveries

Free air	3800
.05 in.	3120
.10 in.	2500
.15 in.	1880
.20 in.	1240

Performance Curves show 22 in. Noiseless Planoidal Blower direct-connected to 1/8 h.p., 8-pole Ballentine Capacitor Motor as used in Hold-Heet Winter Air Conditioner No. ACA1.

THE HOLD-HEET NOISELESS PLANOIDAL BLOWER—a patented Hold-Heet development—is an outstanding contribution to air conditioning. First of all, an air conditioning blower must be quiet. The Planoidal Blower is absolutely noiseless in operation because the maximum beat frequency of 27 per second is below the minimum audible range of the human ear. This result is obtained by limiting the number of blades to two and by direct-connecting to a slow speed multi-pole motor of 8 or more poles. Direct-connecting also eliminates the hum of high speed motors as well as belt and pulley noises.

The outstanding static pressure efficiency of 48% is just as remarkable as the noiseless feature. It is instantly apparent why Hold-Heet Equipment will out-perform any other equipment on the market—why operating costs for electric current are practically cut in half.

SUPERIOR TO ANY OTHER EQUIPMENT. The remarkable static pressure efficiencies of the Hold-Heet Planoidal Blowers are developed in the very middle of the useful operating range and not at some combination of pressure and volume that is not usable in an air conditioning system. The ordinary type of centrifugal blower develops pressures that are completely out of the useful range for the air conditioning field. Such excess pressures simply represent excess operating cost without attendant advantage. Such blowers are deficient in volume, and their high internal resistance when not operating makes them very undesirable on furnace applications because they seriously interfere with free gravity circulation when they are not running. Centrifugal blowers have the further disadvantage that the only way their output can be efficiently utilized is through the use of a scroll and an extremely long, gradually diverging duct between the blower and the plenum chamber—without which a large part of their output, which is in the form of velocity head, is lost. One of the largest selling air conditioning units on the market employing centrifugal blowers has a static pressure efficiency of only 17% in the useful operating range.



CONTROL BOX

Standard Equipment with every Planoidal Blower is a Control Box containing Oil Condenser, Switch, and Panel Board for making all connections. It also contains a 100-speed control with the exception of the Giant Nite Fan equipment.

"THE LAST WORD" in an efficient, noiseless air mover for every type of air conditioning installation, regardless of size. An 18 in. Planoidal Blower is used in the ACB1 Unit. A 22 in. Blower is used in the ACA1 Air Conditioner for furnaces. A 24 in. Blower is used in the ACBD1 Air Conditioning Unit for the boiler heated home with duct systems of distribution. All of these Blowers are direct-connected to 8-pole, Ballentine Capacitor Motors operating at maximum speeds of 800 r.p.m. The Giant Nite Fan employs a 36 in. Blower direct-connected to a 12-pole Ballentine Capacitor Motor operating at 530 r.p.m. This is the only Unit that does not employ the variable speed control. A 30 in. Blower operating at 800 r.p.m. is also available where larger pressures and volumes of air are required, such as school and commercial installations. The output is 5500 c.f.m. at 18 in.

THE BALLENTINE CAPACITOR MOTOR IS IN A CLASS BY ITSELF. Vertically operating on a ball-bearing thrust, it is practically frictionless—it literally floats with the Blower thrust counterbalancing the weight of the rotor. The enormous oil reservoir requires lubrication but once a year. The capacitor type of motor is the most efficient single phase motor that can be built. It is also the most expensive. This costly motor is seldom found on an air conditioning unit because its use would more than double the cost of the motor. The customer pays the difference in high operating cost. This motor, as employed in the Hold-Heet No. 3 Unit for Furnace Heated Homes, has but a 4 ampere starting current. It does not dim the lights. Compare this with the starting current of at least 20 amperes employed on most competing units.

GENERAL INFORMATION ON

Air Conditioning & Air Conditioning Equipment

HEATING is the only one of the four major air conditioning functions with which the public as a whole are quite familiar. It therefore needs no special explanation. Summer cooling, of course, needs no explanation or selling in order to create the desire. The only problem has been that of securing dependable equipment at reasonable cost.

The other two major functions of filtering and humidifying need a lot of explaining because they are so intangible. If the importance of these functions were fully understood, there would be no question about their inclusion whenever a new home is planned or whenever existing structures are modernized.

Filtering

With proper filtering of the air in the home, there is a marked reduction in the amount of dusting that is necessary. Drapes, walls, and furnishings retain their freshness for long periods, so that there is a marked reduction in cleaning bills and redecorating expense. These visual evidences of filtering are of minor importance in comparison with the benefits to health.

85% of our diet is air. We daily consume 3 pounds of food, 4 pounds of water, and 34 pounds of air. Close supervision of water supplies and sewage disposal has practically eliminated water-borne diseases, such as typhoid fever, cholera, etc. Pure food laws and market inspection safeguard the purity and wholesomeness of our food. Practically nothing, however, has been done about the purity of the air we breathe. It is simply taken for granted.

Nature's air filters—the hairs growing within the nose, with their viscous coating provided by mucous secretions—have given ample protection to man in his primitive state. This protection is not sufficient to cope with the increased dust concentration that results from our crowded cities and our great industrial growth. Dust-laden air is not only harmful to the tender membranes of the throat and lungs, but the germs and bacteria carried on the dust particles are also an even greater menace to health. A thimbleful of dust may contain as many as 5,000,000 germs. Dr. Bundesen, the Health Commissioner of Chicago, states that 60% more people are dying from respiratory diseases caused by contaminated air than from all other diseases.

Dust particles carry germs. Such diseases as common colds, influenza, tuberculosis, diphtheria, whooping cough, and scores of others are more often transmitted by air-borne germs than by personal contact. Most germs are heavier than air—and in perfectly clean air would quickly settle to the floor or ground where they could do little or no damage. Since air is not clean, however, many of the germs and bacteria lodge upon dust particles and float for hours, awaiting the opportunity to attack an unsuspecting victim. It is apparent, therefore, that decreasing the dust in the air will decrease the spreading of dust-borne diseases. This is particularly important in confined places where people gather in close proximity. The greater part of all atmospheric dust is invisible, but it is there at all times and in quantities that are absolutely unbelievable.

Important Considerations in Selecting a Filtering and Air Circulating System

While all forms of dust contamination are objectionable, soot, which makes up nearly half of a typical dust sample, is most destructive. Due to its greasy nature, it is not easily wetted by water, and tests show that it passes readily through "air washers" without any appreciable quantity being removed from the air. Water sprays tend to break up the large soot particles into a greater number of smaller ones, which tend to aggravate rather than improve conditions.

All dust, including soot and pollen, is susceptible to wetting with oil. The use of oil to control dust on floors and roads and the way dust collects on any grease spot on the clothes is common knowledge. The modern dry type filter with its viscous adhesive coating is based on this same principle, so that this type of filter has come into general use because of its unusual effectiveness.

Hold-Heet has improved the dry type filter through the use of a new adhesive coating developed in the Hold-Heet laboratories. This coating does not harden but maintains its stickiness and ability to catch dust throughout a wide change in temperature.

Importance of Automatic Humidity

Proper Humidity Is Necessary to Health. U. S. Health Service data show the average home in winter has 12% humidity; the Sahara 20%. Unnatural dryness irritates the sensitive membranes of the nose and throat, subjecting them to attacks of bacteria and germs. A marked increase in respiratory diseases invariably follows the decrease in indoor humidity that comes with the heating season.

Automatic Humidity Is Necessary for Preserving a Soft, Smooth Complexion. Like the cactus, races living in a dry, arid climate develop a tough, leathery skin. When the "eternal oak" in the furniture dries out and cracks, is it any wonder that sensitive human membranes give way?

Proper Humidity Pays Big Dividends. Complete automatic humidity equipment—a Hold-Heet No. 2 Unit—is a permanent solution of the humidity problem in the home. Electric sparks will not spit every time one walks across the floor; complexions will maintain their freshness; and germ-carrying dust which circulates in dry air will be reduced. Curtains, rugs, and draperies will not become brittle and wear out quickly, adding their lint to the accumulating dust. Best of all, the family's health will be protected. There will be fewer colds and smaller medical bills.

How to Judge Home Humidifiers

Approximately 1000 B.t.u.'s must be supplied for every pound of water that is converted to water vapor. This is a lot of heat. Just consider how long a teakettle has to boil before it eventually goes dry. No humidifying equipment can operate in violation of this basic principle. Keep this fact firmly in mind in analyzing the operation of any equipment, for the source of this necessary heat may be used as the basis of classifying this type of apparatus.

Portable Humidifiers. Any portable humidifier not connected to a water supply line may be eliminated as of no value. No householder will continue to supply by hand the 70 to 140 gallons of water per week that are necessary.

Wick Type Humidifiers may be immediately eliminated from consideration. Lime, which is so generally prevalent in tap water throughout the country, quickly accumulates in the wick and destroys its ability to feed water through capillary action. The wick becomes hard and stiff like a board and the lime can not be removed by ordinary washing processes.

Spray Type Humidifiers with Eliminator Plates—Heat Obtained from the Air. All of these devices including jet and target, revolving disc or wheel, or ordinary spray nozzle are of no value unless the water is re-circulated to conserve the heat. Without this provision no appreciable part of the cold tap water is evaporated and the fine spray or mist they produce is stopped by the eliminator plates and cannot reach the warm room where it would evaporate.

Spray Type Humidifiers Without Eliminator Plates. These devices are a failure in practically all sections of the country because of the general prevalence of lime in the water. The extremely fine mist particles produced by these devices are carried into the room where they obtain the necessary heat for evaporation. The small residue of lime gradually settles as a white coating on the furniture and other objects in the room. A large number of test installations were made in Toledo by a responsible firm who later removed all of the equipment because of customer objection to the lime.

Furnace Water Pans. Devices of this type with a float valve are a makeshift which is better than no humidifying device whatever. It is necessarily inadequate in capacity, for without automatic control, equipment capable of supplying adequate humidity in extreme weather would produce excessive dampness in mild weather. The University of Illinois Bulletin No. 48 gives the following conclusions on their tests of dome pans, crescent pans and regular pans, all equipped with float valve to automatically maintain the water level.

"(1) None of the types of warm air furnace water pans tested proved adequate to evaporate sufficient water to maintain 40 per cent relative humidity in the Research Residence except in only moderately cold weather."

Radiator Water Pans. These devices may also be described as a makeshifts. The tests reported in the University of Illinois Bulletin No. 48 used 15 sq. ft. of evaporating surface—many times the area which the ordinary home owner would attempt to employ or keep filled with water. Here are the conclusions:

"(2) The water pans used in radiator shields tested would not prove adequate to maintain 40 per cent relative humidity in a residence similar to the Research Residence when the outdoor temperature approximates zero deg. F."

HOLD-HEET Automatic Humidity Equipment is characterized by ample evaporating capacity, ample heat supply to deliver the necessary energy, float switch to prevent overflowing and waste of water, and a room humidistat to control the water supply and automatically maintain at all times the percentage of relative humidity for which it is adjusted.

Information Bulletins—Free on Request

COOLING WITH GIANT NITE FANS. Full information with University Research Data references.

DEBUNKING POPULAR FALLACIES. Why "Clock Thermostats Seldom Justify Their Expense"—Why "Furnace Fans Are of Negligible Value in Summer Cooling"—"Pitfalls in Air Washing"—Why "Thermostats That 'Anticipate' Are the Bunk"—Facts About Stack Control of Combustion.

HOLD-HEET STOKER CONTROLS. Full information on the standardized equipment already adopted by over 50 stoker manufacturers.

FUEL BLOWERS AND DRAFT BOOSTERS. Bulletin No. 803.

Where to Obtain Hold-Heet Equipment and Installation Service

HOLD-HEET Air Conditioning Equipment is distributed through the Established Heating Trade. There are no exclusive agencies or territories. Your preferred, reliable heating dealer can obtain this equipment from his jobber and can install it. He deserves your support for he will always be there to serve you. His success and permanence in business do not depend upon the success of a few specialties he may handle.

STANDARDIZED PRICES. Any home owner in the United States can buy Hold-Heet Equipment at the f.o.b. Chicago prices shown in this circular. In quoting on an installation, the dealer adds freight and installation costs. The prices shown are for 60 cycle, 115 volt Alternating Current Equipment. Odd cycles and voltages can be supplied at a small advance in price. Direct Current Equipment can not be supplied.

GUARANTEE. Hold-Heet products are guaranteed to be at least equal in quality and performance to any similar products on the market, regardless of price. There is a standard one year service warranty, but it is the Hold-Heet policy to make good, regardless of time. Over 100,000 pieces of Hold-Heet Air Conditioning Equipment have been marketed in the last four years and never yet has a charge been made for repairs or service of any kind. You can buy and specify Hold-Heet with confidence.

WHY SUCH LOW PRICES. Hold-Heet business ethics consider profit a by-product of service—that only by serving faithfully can we succeed. Here is the formula for Hold-Heet Air Conditioning Equipment: (1) Through exhaustive laboratory research, develop the finest reliable equipment that can be built to perform its intended function. (2) Manufacture the equipment—every part complete in one factory—to a standardized, perfected design so that manufacturing and service costs are at a minimum. (3) Distribute through the established heating trade so that selling will be most economical and service will always be assured to the ultimate purchaser.

The success of this policy is proved by the complete Hold-Heet line and the remarkable success it has already attained.

Patronize your regular jobber and your regular dealer when you buy Hold-Heet Equipment.

RUSSELL ELECTRIC COMPANY
Manufacturers
340 West Huron Street - - CHICAGO, U. S. A.
Incorporated 1917



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